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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

NAKAZAWA et al.

Serial No. 09/771,942

Filed: January 30, 2001

For: INK CARTRIDGE AND INK JET PRINTER



Atty. Ref.: 249-161

Group: Not Yet Assigned

Examiner: Not Yet Assigned

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February 12, 2001

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

In order to place the above-identified application in better condition for examination, please amend the application as follows:

IN THE CLAIMS

Please cancel claims 1-21 without prejudice or disclaimer.

Please add claims 22-42 as follows:

--22. An ink cartridge comprising:

a cartridge main body having a first case and a second case joined to the first case;

and

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first and second ink bags each comprising a bag main body storing ink and an outlet through which the ink can be discharged from the bag main body, the first and second ink bags being housed by the first case and the second case,

wherein when the first case and the second case are joined, the outlets of the first and second ink bags are pressed against each other by the first case and the second case.

23. The ink cartridge as claimed in claim 22, wherein the first case comprises a bottom plate portion and a side plate portion with an opening on a top thereof for housing the first and second ink bags, and the second case covers the opening of the first case.

24. The ink cartridge as claimed in claim 23, further comprises a partition plate attached to a predetermined position of the first case, said partition plate separating compartments housing the first ink bag and the second ink bag respectively.

25. The ink cartridge as claimed in claim 24, wherein the partition plate is detachable in a direction substantially perpendicular to the bottom plate portion along the side plate portion, and wherein each of the first case and the second case comprises a partition plate clamp face such that the partition plate is clamped by the partition plate clamp faces for defining the position of the partition plate.

26. The ink cartridge as claimed in claim 23, further comprises a waste-ink holding member for storing waste ink poured therein from the outside thereof, said waste-ink holding member attached to the second case.

27. The ink cartridge as claimed in claim 23, wherein each of the first case and the second case comprises an ink outlet clamp face such that the ink outlets is clamped by

the ink outlet clamp faces for defining the positions of the ink outlets, and wherein at least one of the ink outlet clamp faces is elastically displaceable.

28. The ink cartridge as claimed in claim 27, wherein each of the ink outlets comprises a contact portion in contact with each other and a clamp portion clamping the partition plate with one another.

29. The ink cartridge as claimed in claim 24, further comprises:

a first detection plate attached to the first ink bag, and having a first detection projection extended in a direction substantially perpendicular to the bottom plate portion, the first detection projection moving in the direction substantially perpendicular to the bottom plate portion and projecting from the cartridge main body in response to the consumption of ink in the first bag main body, and

a second detection plate attached to the second ink bag, and having a second detection projection extended in the direction substantially perpendicular to the bottom plate portion, the second detection plate moving in the direction substantially perpendicular to the bottom plate portion and projecting from the cartridge main body in response to the consumption of ink in the second bag main body, wherein

the first and second detection projections differ from each other at least in shape or color.

30. The ink cartridge as claimed in claim 22, wherein the first case forms a first ink cartridge for housing the first ink bag and the second case forms a second ink cartridge for housing the second ink bag, further comprising a joint mechanism for detachably joining the first ink cartridge and the second ink cartridge.

31. The ink cartridge as claimed in claim 30, wherein the first ink cartridge includes a waste-ink holding member.

32. The ink cartridge as claimed in claim 30, wherein the joint mechanism has snap-fit parts formed in a side portion of the first ink cartridge and in a side portion of the second ink cartridge.

33. The ink cartridge as claimed in claim 30, wherein the second ink cartridge comprises a recess into which the first ink cartridge can be fitted in the thickness direction.

34. The ink cartridge as claimed in claim 33, wherein the first ink bag has a first detection plate moved in a thickness direction of the first bag main body in response to the amount of ink remaining in the first bag main body, and the second ink bag has a second detection plate moved in a thickness direction of the second bag main body in response to the amount of ink remaining in the second bag main body,
wherein first and second detection projections are extended in the thickness direction of the first and second bag main bodies from side margins of the first and second detection plates, and have tips projected from the rear of the second ink cartridge as the amounts of ink remaining in the first and second ink bags decrease, and
further wherein the first and second detection projections differ from each other at least in shape or color.

35. The ink cartridge as claimed in claim 34, wherein the first ink cartridge is formed in a side portion with a protection guide surrounding the first detection projection.

36. The ink cartridge as claimed in claim 29, wherein the first and second detection plates are put on surfaces of the bag main bodies of the first and second ink bags, and the plane form of each detection plate overlapping the corresponding bag main body is rectangular,

wherein the width dimension of each detection plate, measured in a direction along the side where the ink outlets of the first and second ink bags are attached, is a value within the range of 0.5 to 1.0 times the width dimension of the corresponding ink bag measured in the direction along the side where the ink outlets of the first and second ink bags are attached, and

further wherein the length dimension of each detection plate is a value within the range of 0.4 to 0.8 times the length dimension of each ink bag.

37. The ink cartridge as claimed in claim 34, wherein the first and second detection plates are put on surfaces of the bag main bodies of the first and second ink bags, and the plane form of each detection plate overlapping the corresponding bag main body is rectangular,

wherein the width dimension of each detection plate, measured in a direction along the side where the ink outlets of the first and second ink bags are attached, is a value within the range of 0.5 to 1.0 times the width dimension of the corresponding ink bag measured in the direction along the side where the ink outlets of the first and second ink bags are attached, and

further wherein the length dimension of each detection plate is a value within the range of 0.4 to 0.8 times the length dimension of each ink bag.

38. The ink cartridge as claimed in claim 36, wherein the ratio between: (i) the ratio between the width dimensions of the first and second detection plates and the width dimensions of the bag main bodies of the first and second ink bags; and (ii) the ratio between the length dimension of each detection plate and the length dimension of the bag main body of each ink bag, is within the range of 0.8 to 1.2.

39. The ink cartridge as claimed in claim 37, wherein the ratio between: (i) the ratio between the width dimensions of the first and second detection plates and the width dimensions of the bag main bodies of the first and second ink bags; and (ii) the ratio between the length dimension of each detection plate and the length dimension of the bag main body of each ink bag, is within the range of 0.8 to 1.2.

40. An ink cartridge comprising:

a plurality of ink cartridges including a first ink cartridge for housing a first ink bag storing first ink, and a second ink cartridge for housing a second ink bag storing second ink of a different color than the first ink, the ink cartridges being detachably joined by a joint mechanism.

41. An ink jet printer comprising:

an ink cartridge having a plurality of ink cartridges including at least a first ink cartridge for housing a first ink bag storing first ink, and a second ink cartridge for housing a second ink bag storing second ink of a different color than the first ink, wherein one of said first and second ink cartridges further includes a waste-ink holding member for storing waste ink poured therein from the outside thereof, the plurality of ink

cartridges being formed in one piece by a joint mechanism for detachably joining the plurality of ink cartridges;

 a placement section in which said ink cartridge detachably is placed; and
 an ink jet head comprising a plurality of ink nozzle groups including a first ink nozzle group for ejecting the ink in the first ink bag of said ink cartridge placed in said placement section, and a second ink nozzle group for ejecting the ink in the second ink bag of said ink cartridge placed in said placement section, said ink jet head being adapted to execute any desired printing on record paper relatively moved

 wherein the waste-ink holding member is placed in the cartridge having the smallest value resulting from dividing the amount of ink in the ink bag housed in each ink cartridge by the number of nozzles of the ink nozzle group corresponding to the ink bag.

42. The ink jet printer as claimed in claim 41, wherein the waste-ink holding member has a holding capacity in the range of 1 to 1.3 times a capacity found by multiplying (i) the volume of ink available to said ink jet head as the amount of ink stored in the ink cartridge in which the waste-ink holding member is placed, by (ii) the total number of nozzles contained in the plurality of ink nozzle groups divided by the number of the ink nozzle groups for ejecting ink in the ink cartridge having the waste-ink holding member.--

REMARKS

Claims 22-42 are present in this application. By this Amendment, claims 1-21 have been canceled and claims 22-42 have been added.

A prompt and favorable Office Action is respectfully requested.

Respectfully submitted,

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